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EXAMINER	
CANTELMO, GREGG	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/997,693	ACKER ET AL.	
	Examiner	Art Unit	
	Gregg Cantelmo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *June 23, 2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received on June 23, 2004:

a. Claims 5, 39 and 40 have been cancelled as per Applicant's request. Claims 1-4 and 6-38 are pending;

b. The drawing objection has been withdrawn in light of the cancellation of claim 5;

c. The specification objection has been withdrawn in light of the amendment;

d. The claim objections have been withdrawn in light of the amendment;

e. The 112 rejections have been withdrawn except for those issues maintained herein (see below);

f. The instant claims are rejected under various prior art rejections as set forth herein.

Information Disclosure Statement

2. The information disclosure statement filed June 23, 2004 has been placed in the application file and the information referred to therein has been considered as to the merits.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-4 and 6-38 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the electrolyte being gas permeable for carbon dioxide only, does not reasonably provide enablement for the electrolyte membrane being generically gas permeable. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. Generically claiming that the electrolyte membrane is gas permeable is not adequately enabled for all gases. The specification does not have support for any other permeability (oxidant, air, fuel, water vapor) through the membrane and crossover of reactants across the electrolyte are not effective and results in a decrease in reactant utilization and fuel cell performance. Thus the scope of the claims extend beyond that which Applicant is entitled to and further potentially beyond operative fuel cells (in light of the claimed membrane including reactant gas permeability).

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 9 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. As set forth in the previous office action, claim 9, contains the trademark/trade name ZITEX. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second

paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name;

b. The term "NTPA" is not clearly defined by the instant application and is indefinite. Further if this is an acronym for the various constituents therein then the term NTPA would still include the trademark/trade name NAFION. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 4, 6, 18-21, 23, 24 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,085,950 (Primdahl).

Primdahl discloses a membrane electrolyte 30 for a fuel cell comprising a first material for conducting protons across the membrane 30 and a second material 20i organized and arranged in one or more predetermined locations through the first material for conducting gases across the membrane (Fig. 3 as applied to claim 1).

The first material comprises a first field and the second material comprises a second field (Fig. 3 as applied to claim 2).

The first and second materials are formed into a single layer and are fastened to one another to form the sheet layer shown in Fig. 3 (as applied to claim 4).

Structurally at least a portion of layer 30 includes the first materials defining openings wherein the second materials 20i are disposed (Fig. 3 as applied to claim 6).

The first and second materials are combined to form a single layer structure (Fig. 3 as applied to claim 18).

The second material 20i is divided into a plurality of portions which are spaced apart along the first material (Fig. 3 as applied to claim 19).

The sum plurality of the portions extends across the entire electrolyte (Fig. 3 as applied to claims 20 and 21).

The first and second materials are separated from one another (Fig. 3 as applied to claim 23).

Primdahl discloses a membrane electrolyte 30 for a fuel cell comprising a first material for conducting protons across the membrane 30 and a vent 20i for conducting gases across the membrane (Fig. 3 as applied to claim 24).

Primdahl discloses a membrane electrolyte 30 for a fuel cell comprising a first material for conducting protons across the membrane 30 and a second material 20i organized and arranged in one or more predetermined locations through the first material for conducting gases across the membrane disposed within a housing (Figs. 3 and 4 as applied to claim 33).

Response to Arguments

9. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-3, 6-10, 17-21 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. patent No. 6,465,136 (Fenton).

Fenton discloses a membrane electrolyte comprising a proton conducting first material and a second porous (gas conducting) material (abstract as applied to claim 1).

The materials are separate and distinct from each other and thus constitute first and second "fields". The claim does not provide sufficient specificity as to the nature of the term field and thus the term is reasonably

interpreted to be regions having distinct first polymer and second polymer (as applied to claim 2).

The materials are bonded together (abstract as applied to claim 3).

The first and second materials are blended together. By mixing the materials the blend causes second material to be dispersed within the first material. Each spot occupied by the second material then is held to be a filled opening between the dispersed first material and vice versa (abstract as applied to claim 6).

The first material is a hydrophilic polymer such as phosphotunstic acid and Nafion (col. 9, ll. 1-60 as applied to claim 7).

The first material can be NAFION and PTFE (col. 9, ll. 1-7 as applied to claim 8).

Fenton teaches of NAFION (having an inherent Teflon constituent therein) and phosphotungstic acid or zirconium hydrogen phosphate (col. 2, ll. 33-46 as applied to claims 9 and 10).

The first material is coated with a catalyst (col. 6, ll. 7-17 as applied to clam 17).

The first and second materials are blended into a single layer (abstract as applied to claim 18).

The first and second materials are blended together. By mixing the materials the blend causes second material to be dispersed within the first material. At least a portion of which will include plural second material portions spaced relative to the first material (Figs. 2 and 3 as applied to claim 19).

The first and second materials are dispersed along the width and length of the electrolyte (Figs. 2 and 3 as applied to claims 20 and 21).

The first material and second materials are distinct materials as discussed above and thus separate from each other (as applied to claim 23).

Response to Arguments

11. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The phrase "organized and arranged in one or more predetermined locations through a first proton conducting material for conducting gas" is broad enough to read on the disclosure of Fenton.

The porous material of the electrolyte is dispersed in a location defined by the separator shape and is arranged within this shape along with the proton conducting material.

It is noted that the previous office action erroneously identified the Fenton patent by an incorrect patent number. To clarify the record, the correct patent number has been applied and cited on form PTO 892 enclosed with this office action.

Claim Rejections - 35 USC § 103

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fenton in view of WO 97/19480A (WO '480).

The teachings of claim 1 with respect to Fenton have been discussed above and are incorporated herein.

The differences between instant claim 11 and Fenton is that Fenton does not teach of the proton conducting material comprising the specific claimed material.

WO '480 teaches of using H-SPEEK as a proton conducting material (page 17, ll. 1-12).

The motivation for using PEEK is that it provides an electrolyte material having superior ionic conductivity.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Fenton in view of WO '480 by using PEEK in the electrolyte membrane since it would have provided an electrolyte material having superior ionic conductivity. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

13. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fenton in view of U.S. patent No. 5, 525,436 (Savinell).

The teachings of claim 1 with respect to Fenton have been discussed above and are incorporated herein.

The differences between instant claim 12 and Fenton is that Fenton does not teach of the proton conducting material comprising the specific claimed material.

Savinell teaches that films comprising polymers containing basic groups that can form complexes with stable acids or polymers containing acidic groups provide a viable alternative to known PEM's and other conventional electrolytes. Polybenzimidazole (PBI) which has been doped with a strong acid, such as phosphoric acid or sulfuric acid, is an example of a suitable polymer. Polybenzimidazoles, along with other suitable aromatic polymers, basic enough to complex with acids, exhibit excellent oxidative and thermal stability characteristics, these properties being further enhanced by doping at a level of at least 200 mol %. They require low water activity, thus avoiding operating temperature limits due to the boiling point of water. Capability to operate at elevated temperatures, i.e. up to at least 200.degree. C., also reduces the potential for anode/cathode poisoning. Further, they do not suffer significantly from methanol cross-over because of low methanol swelling with methanol vapor and high glass transition temperatures.

The motivation for using PBI in the electrolyte membrane is that it provides a material having excellent oxidative and thermal stability characteristics, require low water activity, reduce electrode poisoning and reduce reactant crossover.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Fenton in view of Savinell by using PBI in the electrolyte membrane since it would have provided a material having excellent oxidative and thermal stability characteristics, require low water activity, reduce electrode poisoning and reduce reactant crossover. The selection of a known material based on its suitability for

its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

14. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fenton in view of JP 11-086630-A (JP '630).

The teachings of claim 1 with respect to Fenton have been discussed above and are incorporated herein.

The differences between instant claim 13 and Fenton is that Fenton that does not teach of the proton conducting material comprising the specific claimed material.

JP '630 teaches that it is known to use PVDF as an ionic conducting material in solid electrolytes because it has superior ionic conductivity.

The motivation for using PVDF in the electrolyte membrane is that it provides an ionic conducting material in solid electrolytes because it has superior ionic conductivity.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Fenton in view of JP '630 by using PVDF in the electrolyte membrane since it would have provided an ionic conducting material in solid electrolytes because it has superior ionic conductivity. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

15. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fenton in view of either JP 08-088007-A (JP '007), U.S. patent No. 5,176,966 (Epp), or U.S. patent No. 5,573,162 (Van Dine).

The teachings of claim 1 with respect to Fenton have been discussed above and are incorporated herein.

The differences between instant claim 15 and Fenton is that Fenton does not teach of the providing a catalyst coating on the membrane electrode.

The membrane is used as an electrolyte layer of a fuel cell. In forming the fuel cell array, a catalytic layer is provided adjacent to the electrolyte layer and electrodes to catalyze the reactant gases and effectively generate electricity (as shown in the Figs. 1 and 2 of JP '007 and Fig. 1 of Van Dine). The catalyst promotes electrochemical reaction of hydrogen and oxygen, thereby producing electrical current (col. 8, ll. 6-10 of Epp).

The motivation for providing a catalyst layer on the electrolyte membrane is to form a region between the electrolyte and electrode so as to catalyze the reactant gases and generate electricity.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Fenton in view of either JP '007 or Van Dine by providing a catalyst layer on the electrolyte membrane since it would have formed a region between the electrolyte and electrode so as to catalyze the reactant gases and generate electricity.

Response to Arguments

16. Applicant provides no further arguments to the various 103 rejections to Fenton apart from that directed to the anticipatory rejection discussed above.

Claim Rejections - 35 USC § 103

17. Claims 25-27 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 5,176,966 (Epp) in view of or Fenton.

Epp teaches of an MEA in Fig. 6 comprising: an electrolyte membrane 43, first and second catalyst layers 54 disposed on opposing sides of membrane 43, and gas diffusion layers 44 and 50 (Fig. 6 as applied to claim 25).

Layers 44 and 50 comprise carbon fiber paper (col. 8, ll. 20-22 as applied to claims 26 and 27).

The fiber papers 44 and 50 are treated with a Teflon additive (col. 8, ll. 20-35 as applied to claims 29 and 30).

The carbon paper has inherent channels which permit the flow of gas to and from the electrolyte membrane, thereby generating electric current (as applied to claim 32).

The difference between instant claim 25 and Epp is that Epp does not teach of the electrolyte layer having first and second materials as recited therein.

Fenton teaches of electrolyte materials having a first material which is proton conducting and a second material which is gas evolving (as discussed in the anticipatory rejections in the previous office action, incorporated herein).

The motivation for using the electrolyte membranes of Fenton is that it provides an ultra-thin composite membrane having excellent ionic conductivity.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Epp by using the electrolyte membrane of Fenton since it would have provided an ultra-thin composite membrane having excellent ionic conductivity.

18. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epp in view of Fenton as applied to claims 25-27 and 30-32 above, and further in view of U.S. patent No. 5,798,186 (Fletcher).

The teachings of claim 25 have been discussed above, incorporated herein.

The difference not yet discussed is of the porous carbon being a carbon cloth.

Fletcher teaches that both carbon fiber paper and carbon cloth are known equivalent gas diffusive layers for use in MEAs (col. 1, ll. 15 -29).
Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Epp by using carbon cloth or carbon fiber paper as the gas diffusive layer since both materials are shown by Fletcher to be equivalent materials for use as such. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

19. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Epp in view of Fenton as applied to claims 25-27 and 30-32 above, and further in view of U.S. patent No. 4,248,682 (Lindstrom).

The teachings of claim 25 have been discussed above, incorporated herein.

The difference not yet discussed is of the gas diffusion layer including a thickness between approximately 150-400 microns.

Lindstrom teaches that carbon gas diffusion electrodes having preferred thick nesses between 10 and 35 mils (254-889 microns) has long since been established in the art (col. 3, ll. 55-60).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Epp by selecting the gas diffusion layer(s) to include a thickness between approximately 150-400 microns since such thick nesses are shown to provide gas diffusion members having optimal electromechanical properties. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesche , 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or

value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

20. Claims 25-27, 32 and 34--38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 5,945,231 (Narayanan) in view of Fenton.

Narayanan discloses a fuel cell comprising a housing 102 forming an anode chamber 122 and a cathode chamber 132, proton conducting membrane electrolyte 110, catalyst layers proximate the electrolyte (Figs. 1-3B), and gas diffusion layers (col. 3, ll. 30-50 as applied to claims 25 and 33-35 and 38).

The fuel cell comprises a housing as further defined in claim 33.

The fuel cell comprises a housing and electrode chambers as further defined in claims 34 and 35.

The fuel cell comprises a fuel delivery device and fuel source having a carbonaceous fuel in fluid communication with the fuel delivery device, gas inlets and outlets to both the anode chamber and cathode chamber (Fig. 1) as further defined in claim 35.

The fuel cell comprises a fuel delivery device, fuel source in fluid communication with the fuel delivery device, anode chamber having a gas inlet for receiving the fuel mixture, cathode having an inlet and outlet (Fig. 1) as further defined in claim 38.

The backing layer can be a carbon fiber sheet (col. 3, ll. 43-44 as applied to claims 26 and 27).

The carbon paper has inherent channels which permit the flow of gas to and from the electrolyte membrane, thereby generating electric current (as applied to claim 32).

With respect to claims 36-37:

The fuel source is a part of the fuel cell system and is internal to the fuel cell system (Fig. 1 as applied to claim 36).

The fuel cell source is external to the fuel cell stack component of the system (Fig. 1 as applied to claims 37).

The difference between instant claims 25 and 33-35 and Narayanan is that Narayanan does not teach of the electrolyte layer having first and second materials as recited therein.

Fenton teaches of electrolyte materials having a first material which is proton conducting and a second material which is gas evolving (as discussed in the anticipatory rejections in the previous office action, incorporated herein).

The motivation for using the electrolyte membranes of Fenton is that it provides an ultra-thin composite membrane having excellent ionic conductivity.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Narayanan by using the electrolyte membrane of Fenton since it would have provided an ultra-thin composite membrane having excellent ionic conductivity.

21. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narayanan in view of Fenton as applied to claims 25-27, 32, and 34-38 above, and further in view of U.S. patent No. 5,798,186 (Fletcher).

The teachings of claim 25 have been discussed above, incorporated herein.

The difference not yet discussed is of the porous carbon being a carbon cloth.

Fletcher teaches that both carbon fiber paper and carbon cloth are known equivalent gas diffusive layers for use in MEAs (col. 1, ll. 15 -29).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Narayanan by using carbon cloth or carbon fiber paper as the gas diffusive layer since both materials are shown by Fletcher to be equivalent materials for use as such. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

22. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narayanan in view of Fenton as applied to claims 25-27, 32, and 34-38 above, and further in view of U.S. patent No. 4,248,682 (Lindstrom).

The teachings of claim 25 have been discussed above, incorporated herein.

The difference not yet discussed is of the gas diffusion layer including a thickness between approximately 150-400 microns.

Lindstrom teaches that carbon gas diffusion electrodes having preferred thick nesses between 10 and 35 mils (254-889 microns) has long since been established in the art (col. 3, ll. 55-60).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Narayanan by selecting the gas diffusion layer(s) to include a thickness between approximately 150-400 microns since such thick nesses are shown to provide gas diffusion members having optimal electromechanical properties. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesche , 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

23. Claims 30 and 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Narayanan in view of Fenton as applied to claims 25-27, 32, and 34-38 above, and further in view of Epp.

The teachings of claim 25 have been discussed above, incorporated herein.

The differences not yet discussed are of providing a Teflon additive to the gas diffusion layer.

The fiber papers 44 and 50 are treated with a Teflon additive (Epp, col. 8, ll. 20-35 as applied to claims 29 and 30).

The motivation for coating the carbon gas diffusion electrode with Teflon is to improve the water repellency of the electrode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Narayanan by adding Teflon to the carbon electrodes since it would have improve the water repellency of the electrode.

Response to Arguments

24. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejections.

The phrase "organized and arranged in one or more predetermined locations through a first proton conducting material for conducting gas" is broad enough to read on the disclosure of Fenton.

The porous material of the electrolyte is dispersed in a location defined by the separator shape and is arranged within this shape along with the proton conducting material.

It is noted that the previous office action erroneously identified the Fenton patent by an incorrect patent number. To clarify the record, the correct patent number has been applied and cited on form PTO 892 enclosed with this office action.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPAT 4,469,562 (Chang) discloses a carbon dioxide sensor which has a CO2 permeable electrolyte. USPAT 4,828,941 (Sterzel) discloses a methanol fuel cell wherein the anion exchanger is CO2 permeable. WO 03/096455 discloses a methanol fuel cell where the electrolyte membrane is CO2 permeable. U.S. Patent Application Publication No. 2002/0106549 (Cooper) discloses an electrolyte which is CO2 permeable. USPAT 6.541.159 (Li) discloses an electrolyte membrane having a channels formed therethrough.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on

access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo
Primary Examiner
Art Unit 1745

gc

September 16, 2004